DIMEO, MELISSA A., M.A. The Role of Cognitive Appraisals in the Relationship between Reinforcement Sensitivity and Coping Strategies. (2016)
Directed by Dr. Rosemery O. Nelson-Gray. 51 pp.

Previous research in the stress and coping literature has not fully addressed the role of biologically-based personality systems in the prediction of coping behaviors. As a biologically-derived theory of personality, Reinforcement Sensitivity Theory (RST; Gray, 1970, 1991; Gray & McNaughton, 2000; McNaughton & Corr, 2004) proposes that the behavioral inhibition system (BIS) and the behavioral approach system (BAS) underlie personality dimensions and influence individual differences in reinforcement sensitivity and emotion. The purpose of this study was to evaluate the role of personality variables as assessed by Reinforcement Sensitivity Theory in influencing cognitive appraisals and subsequent coping responses by taking an individual differences approach to psychological stress and coping. Given individual variation in BIS and BAS, it was hypothesized that individuals would experience different perceptions of stress and changeability in response to stressful life events, and thus, select different coping strategies. Specifically, it was predicted that increased BIS sensitivity would lead to a higher perception of stress and lower perception of changeability among individuals. In contrast, it was predicted that increased BAS sensitivity would lead to lower perception of stress and higher perception of changeability among individuals. It was predicted that cognitive appraisals would partially mediate the relationship between reinforcement sensitivity and coping strategies, including emotion-, avoidance-, and problem-focused forms of coping. Undergraduate psychology students (n = 429) completed items of the BIS/BAS Scales, COPE Inventory, and were presented with stress vignettes adopted from

the Interpretation Bias Questionnaire to assess reinforcement sensitivity, coping strategies, and cognitive appraisals, respectively. Consistent with hypotheses, significant associations were found between BIS and perception of stress, BIS and avoidance-focused coping, as well as perception of stress with emotion-focused and problem-focused coping. While not in the predicted direction, significant associations were found between BIS and perception of changeability and perception of changeability with emotion-focused and problem-focused coping. Bootstrapping analyses indicated that perception of changeability mediated the relationship between BIS and problem-focused coping. Unexpectedly, suppression effects were indicated in three of the mediational models. When perception of stress was included in the model, the associations between BIS and emotion-focused coping, as well as BIS and avoidance-focused coping actually became stronger. Also, the association between BIS and emotion-focused coping became stronger when perception of changeability was included in the model. In contrast, cognitive appraisals of stress and changeability did not mediate the relationships between BAS and the three coping strategies. These results do not provide support for the prediction that personality variables are associated with coping partially through cognitive appraisals.

THE ROLE OF COGNITIVE APPRAISALS IN THE RELATIONSHIP BETWEEN REINFORCEMENT SENSITIVITY AND COPING STRATEGIES

by

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A Thesis Submitted to
the Faculty of The Graduate School at
The University of North Carolina at Greensboro
in Partial Fulfillment
of the Requirements for the Degree
Master of Arts

Greensboro
2016

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CHAPTER I

INTRODUCTION

Psychological Stress and Coping

Lazarus and Folkman (1984) define coping as the "cognitive and behavioral efforts to manage specific external and/or internal demands that are appraised as taxing or exceeding the resources of the person" (p. 141). The cognitive component of a person's coping ability involves their ability to identify how threatening or important a stressful event is considered to his/her well-being. The behavioral component of a person's coping ability refers to the actual strategies which the person uses.

Although there are numerous theories that address the coping process, this study utilized the cognitive theory of psychological stress and coping proposed by Lazarus and Folkman (1984). This model is one of the most widely used conceptualizations of the coping process and drives much of the research on this topic. In addition, this theory evaluates the role of cognitive appraisal in understanding the coping process for stressful life events (Folkman & Moskowitz, 2004). Lazarus and Folkman's (1984) psychological stress and coping theory identify two major forms of coping strategies: problem-focused and emotion-focused. Problem-focused coping involves managing or altering the problem causing distress within the environment and is "often directed at defining the problem, generating alternative solutions, weighting the alternatives in terms of their costs and benefits, choosing among them, and acting" (p. 152). A problem-focused

coping strategy is more likely to occur when an individual appraises the situation as amenable to change (Folkman & Lazarus, 1980). Thus, an individual is more likely to employ problem-focused forms of coping when he/she appraises situations as controllable or changeable. Emotion-focused coping occurs when an individual attempts to regulate the emotional response to the situation and uses cognitive processes aimed at lessening the emotional distress (Lazarus & Folkman, 1984). For instance, an individual utilizing an emotion-focused form of coping may release pent-up emotions or manage hostile feelings. An emotion-focused coping strategy typically occurs when an individual's appraisal of a situation is that nothing can be done to modify conditions that are perceived as challenging, threatening, or harmful. Thus, the use of emotion-focused coping is more probable when an individual appraises a situation as uncontrollable or unchangeable. Although these coping procedures are not mutually exclusive and individuals can employ various strategies across different situations, personality characteristics may restrict an individual's cognitive appraisal or coping style and predispose them to specific patterns across a range of contexts.

In recent coping theory, avoidance-focused coping was distinguished as a third dimension of coping style (Folkman & Moskowitz, 2004). Avoidance-focused coping involves behaviors that were previously considered to be emotion-focused forms of coping. For instance, coping behaviors such as drug and alcohol use are better classified as avoidance-focused forms of coping. Avoidance-focused coping can be defined as the removal of experience of and/or thoughts about a stressful situation (Britton, 2004). Folkman and Moskowitz (2004) suggested that the addition of avoidance-focused

strategies to emotion-focused and problem-focused coping allows for more precise categories and better accounts for individual coping differences (Hasking & Oei, 2002).

Cognitive Appraisals

The stress and coping literature has consistently shown that cognitive appraisals predict coping strategies. Lazarus and Folkman (1984) identify cognitive appraisal and coping as the two critical processes that mediate the person-environment relationship. Cognitive appraisal is defined as "an evaluative process that determines why and to what extent a particular transaction or series of transactions between the person and the environment is stressful" (p. 23). Since person-centered characteristics are influential to coping at the most basic level, different people will use diverse behaviors to cope with the same situation (Folkman & Lazarus, 1985). The literature has shown that in order to understand individual differences in similar situations, we must take into account the cognitive appraisals that fall between the stressful encounter and the individual's response.

Psychological stress is defined as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 12). However, there is no objective method to predict an individual's reaction of psychological stress without taking into account their individual differences. Since people can differ in the ways they appraise a stressful encounter and in the ways they cope with the demands of a stressful encounter, one must account for all possible scenarios. Taking individual differences into account is especially important for the

findings of the stress and coping literature to be applicable and helpful to the most individuals. Given that most research suggests that appraisal of an outcome as controllable reduces stress, situational control appraisals were found to be strongly related to coping. Specifically, situations appraised as changeable and challenging were associated with more problem-focused coping strategies, whereas situations that were appraised as uncontrollable, threatening, and had to be accepted were associated with more emotion- and avoidance-focused forms of coping (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986; Gan, Anshel, & Kim, 2009; Newton & McIntosh, 2010). Williams, Hundt, and Nelson-Gray (2012) suggested that an individual's perception of stressful events influences the stress and coping process such that greater levels of perceived stress contribute to the use of emotion- and avoidance-focused coping whereas lower levels of perceived stress lead to the use of problem-focused behaviors.

Lazarus and Folkman's (1984) cognitive theory highlighted the role of cognitive appraisal in response to a variety of stressors. However, the theory neglected to examine the influence of personality variables on emotional responses, cognitive appraisals, and coping behaviors. This study addressed the impact of a biologically-based theory of personality assessing reinforcement sensitivity in the understanding of individual differences in the selection and use of coping strategies. Taking individual differences into account is critical for the findings of the stress and coping literature to be generalizable to the greatest number of individuals. If we consider biologically-based personality variables, BIS and BAS may act as predisposing personality traits that predict cognitive appraisals or the choice of coping behaviors among individuals. This

viewpoint enhances our understanding of how personality variables can impact the selection of coping strategies and how an individual's cognitive appraisal of a stressful situation can modify this relationship. This study further addressed our understanding of the individual differences that need to be accounted for when taking an individualized approach to coping with stress.

Reinforcement Sensitivity Theory

Reinforcement Sensitivity Theory (RST; Gray, 1970, 1991; Gray & McNaughton, 2000; McNaughton & Corr, 2004) is a biologically-based theory of personality proposing that three brain systems underlie orthogonal personality dimensions and reflect individual differences in reinforcement sensitivity and emotion. Gray (1970) proposed this initial theory as a modification of Eysenck's descriptive model of personality (Eysenck, 1967) such that the descriptive axes were found to reflect the activities of brain systems responsible for emotional behavior. In accordance with the model, Eysenck's extraversion and neuroticism dimensions would be derivatives of the more fundamental reward and punishment sensitivities. Gray (1988) demonstrated the independence of appetitive and aversive motivation in this descriptive model by incorporating impulsivity to account for reward sensitivity and anxiety to account for punishment sensitivity (Corr, 2008).

The Behavioral Approach System (BAS) is sensitive to signals of reward. BAS activates approach behavior in response to appetitive stimuli and initiates an individual's movement toward goals. BAS is associated with positive affect, feelings of elation, and is associated with some impulsivity (Corr, 2004; Pickering & Gray, 1999). BAS is

related to the impulsivity dimension in terms of individual differences in personality and extends from the stable introvert quadrant for low BAS to the neurotic extravert quadrant for high BAS. The Behavioral Inhibition System (BIS) is sensitive to signals of punishment and novel stimuli. BIS increases attention, arousal, and has been conceptualized as an anxiety system (Gray, 1991; McNaughton & Corr, 2004). BIS is related to negative outcomes, feelings of sadness, and anxiety. BIS is related to the trait anxiety dimension in terms of individual differences in personality and spans from the stable extravert quadrant for low BIS to the neurotic introvert quadrant for high BIS in relation to the dimensions proposed by Eysenck.

Prior literature has scantily explored the associations between BIS sensitivity, BAS sensitivity, and some types of cognitive appraisals. Earlier work by Folkman and Lazarus (1980; 1984) examined the influence of controllability on selection of coping strategies. For example, these authors suggested that an individual's perception of an event as more amenable to change would likely result in the use of problem-focused coping behaviors. This idea is in contrast to the thought that a situation which is perceived as less amenable to change would incite increased levels of anxiety and arousal. A recent study by Hundt et al. (2012) examined the relationship between BIS and perceptions of stressful situations by utilizing a measure of life stress among individuals. Similarly, Williams et al. (2012) examined the impact of perceived stress as cognitive appraisals among individuals high in BIS sensitivity. This study suggested that greater levels of perceived stress among high BIS individuals led to an increased use of emotion- and avoidance-focused coping. However, previous coping literature is lacking

when it comes to the examination of perception of changeability as a form of cognitive appraisal.

Carver and Connor-Smith (2010) acknowledged the limited research that has examined the direct relationship between the biologically-based personality system described by reinforcement sensitivity theory and coping behaviors. However, a few studies have examined the possible relationships between reinforcement sensitivity theory, specifically BIS and BAS, and substance abuse, eating behaviors, and delinquency. Derryberry, Reed, and Pilkenton-Taylor (2003) proposed that given the association of BIS with vulnerability to distress, BIS sensitivity should be more likely to predict coping behaviors that aim to minimize negative emotions, or emotion-focused strategies. In addition, given the association of BIS with avoidance of threatening information, BIS sensitivity should predict coping behaviors that attempt to avoid perceived threats, or avoidance-focused strategies (Derryberry et al., 2003). Hasking (2006, 2007) found BIS to be positively associated with non-productive coping behaviors in a study of eating and drinking behaviors, as well as an examination of delinquent behavior in adolescents, suggesting that individuals with high BIS sensitivity are more likely to employ emotion-focused and avoidance-focused forms of coping. Corr (2008) proposed that the multi-faceted nature of BAS and the heterogeneity of BAS-related goals act as possible barriers to identifying a single BAS-related behavioral pattern in coping with stress. Prior studies have not managed to identify a preference for type of coping strategy in individuals with high BAS sensitivity. Williams et al. (2012) found that BAS sensitivity facilitated the use of various coping strategies. Thus, individuals

high in BAS may resort to using a trial-and-error approach with many coping behaviors as a result of their underlying predisposition for impulsivity.

Past research has found mixed and inconsistent results regarding the influence of variables such as sex, ethnicity, and socioeconomic status on the coping process (Eaton & Bradley, 2008; Plummer & Slane, 1996; Thompson, 2006). The present study focused on other individual differences, namely, the impact of biologically-based personality dimensions of BIS and BAS on the psychological stress and coping process. This study addressed the role of biologically-derived personality variables in influencing cognitive appraisals and coping by taking an individual differences approach to coping. Individual differences in predisposing personality traits, such as BIS and BAS, can predict cognitive appraisals, specifically perceptions of stress and changeability, in stressful situations. It was hypothesized that individuals will experience different perceptions of stress and changeability in response to stressful life events, and subsequently, select different coping strategies. This study tested the following predictions:

1. Individuals higher in BIS would have a higher perception of stress and a lower perception of changeability than individuals lower in BIS when given a stress vignette.
2. Individuals higher in BAS would have a lower perception of stress and a higher perception of changeability than individuals lower in BAS when given a stress vignette.
3. Individuals higher in BIS would be more likely to choose emotion-focused and avoidance-focused coping strategies than individuals lower in BIS. There was no

specific prediction for BIS and problem-focused coping.

4. Individuals higher in BAS would show no difference in choosing between emotion-focused, avoidance-focused, and problem-focused coping strategies than individuals lower in BAS.

5. Cognitive appraisals that situations are stressful and/or unchangeable, would partially mediate the relationship between BIS and emotion-focused coping strategies.

6. Cognitive appraisals that situations are stressful and/or unchangeable, would partially mediate the relationship between BIS and avoidance-focused coping strategies

CHAPTER II

METHOD

Participants

Participants were undergraduate students (n = 429) who were recruited through introductory psychology courses at the University of North Carolina at Greensboro. Participants were recruited using open enrollment and received course credit for their participation. There was no restriction on sex, ethnicity, or socioeconomic status among participants. The final sample size (n = 429) excludes nine participants who endorsed three or more items on the Infrequency Scale for Personality Measures (IFS; see description below). Consistent with this university's demographics, the sample (mean age = 19.2, SD = 3.8) was predominantly female (71%), Caucasian (60%), and African American (24%).

Materials

The *Behavioral Inhibition System/Behavioral Activation System Scales* (BIS/BAS Scales; Carver & White, 1994; see Appendix A) are a 20-item self-report measure of emotional response in situations that may evoke anxiety or impulsivity. There is a single BIS scale and three BAS-related scales combined to assess BAS, including Drive, Fun Seeking, and Reward Responsiveness. While there are three BAS-related scales, this study utilized a single measure of BAS encompassing all three subsets. A sample BIS item is "I feel pretty worried or upset when I think or know somebody is angry at me",

while a sample BAS item is "When I go after something I use a 'no holds barred' approach". The BIS/BAS Scales have good internal consistency (.84-.89) and good convergent and discriminant validity (Campbell-Sills, Liverant, & Brown, 2004).

The *Infrequency Scale for Personality Measures* (IFS; Chapman & Chapman, 1986; see Appendix B) is a 13-item scale that contains statements that are unusual or infrequent in nature and are used to determine random responding among participants. This scale was embedded in the BIS/BAS Scales. A total of nine participants who endorsed three or more items on the IFS were excluded from the final statistical analyses.

Vignettes were taken from the *Interpretation Bias Questionnaire* (IBQ; Wisco & Nolen-Hoeksema, 2010; see Appendix C) to assess coping styles in response to potentially stressful situations. This questionnaire presents vignettes describing ambiguous everyday situations typically experienced by young adults. An example vignette reads "You call a good friend of yours and leave a message suggesting getting together later in the week. A few days pass, and you haven't heard from them. Why haven't they returned your call?" The vignettes are ambiguous in nature to allow for multiple types of interpretations. The eleven vignettes selected for this study were rated as easiest to imagine by participants and generated a mean of at least 3 interpretations in prior work reported by Wisco and Nolen-Hoeksema (2010).

Participants were asked to imagine the scenario in each vignette of the questionnaire. In order to evaluate cognitive appraisal and each participant's individual perception of stress and changeability in the given vignettes, they were asked to rate the following questions on a Likert-type scale from 1 *("not at all")* to 7 *("a lot")*: "How

much stress do you think this situation would cause you?" and "How much do you think you could change this situation?" Perception of stress reflects the mean total stress perception summed across 11 vignettes for all participants with higher scores reflecting higher perception of stress. Perception of changeability reflects the mean total changeability perception summed across 11 vignettes for all participants with higher scores reflecting higher perception of changeability.

In order to assess the type of coping strategy each respondent would use in the given situation, participants were asked "What would you do in this situation?" The open-ended nature of this response allowed participants to generate their own coping strategy. However, this question was not analyzed for the purposes of this paper. Next, participants were asked to rank order the coping strategies they would use in each situation from a list of nine solutions. The nine solutions were taken from the *COPE Inventory* (COPE; Carver, Scheier, & Weintraub, 1989; see Appendix D). The *COPE Inventory* is a 49-item self-report measure that assesses the use of various coping strategies in response to stress. Participants indicated the degree to which they were likely to use nine of the same coping strategies selected from the COPE according to factor loadings for each vignette from 1 *("most likely to use")* to 9 *("least likely to use")*. The COPE entails 14 subscales, including active coping, planning, suppression of competing activities, restraint coping, seeking social support for instrumental reasons, seeking social support for emotional reasons, positive reinterpretation and growth, acceptance, turning to religion, focus on and venting of emotions, denial, behavioral disengagement, mental disengagement, and alcohol-drug disengagement. Confirmatory

factor analyses suggest that these 14 subscales load onto three higher order factors with good fit indices: problem/task, emotion, and avoidance coping (Hasking & Oei, 2002). Active coping, planning, suppression of competing activities, restraint coping, seeking social support for instrumental reasons, and seeking social support for emotional reasons load onto the problem/task coping factor. Positive reinterpretation and growth, acceptance, and focus on and venting of emotions load onto the emotion coping factor. Denial, behavioral disengagement, mental disengagement, turning to religion, and alcohol-drug disengagement load onto the avoidance coping factor. The three broad subscales have moderate to good internal consistency reliability, with α ranging from .69 to .89, as well as good convergent and discriminant validity (Carver et al., 1989; Hasking & Oei, 2002; Lyne & Roger, 2000).

Among the nine options taken verbatim from the COPE and provided to the participant, three solutions were provided corresponding to each coping strategy discussed in this study. Thus, three solutions were problem-focused, three solutions were emotion-focused, and three solutions were avoidance-focused. Participants were asked to rank order the nine responses from 1 *("most likely to use")* to 9 *("least likely to use")*. The sum of these rankings for each type of coping strategy across all the vignettes provided an overall score for each participant and allowed for the type of coping strategies to be a continuous variable. Each participant ended up with three total scores for each higher order factor, or type of coping strategy, with scores ranging from 66 to 246. For example, a participant endorsing a rating of 1, 2, and 3 across three solutions from the same type of coping strategy and 11 vignettes would have a score of 66 for

his/her selected strategy. A participant endorsing a rating of 7, 8, and 9 across three solutions from the same type of coping strategy and 11 vignettes would have a score of 264 for his/her selected strategy. The mean for each coping strategy reflects the overall score for each type of coping method as ranked across 11 vignettes for all participants. The three coping strategy variables were reverse-scored so that higher values reflected a greater likelihood to use the specific coping method.

Procedure

Participants were required to electronically sign a consent form since the measures were administered online via Qualtrics. The measures included the BIS/BAS Scales with the IFS embedded within and the vignettes adopted from the Interpretation Bias Questionnaire (IBQ) with items from the COPE Inventory as potential responses. After completion, participants were shown a debriefing form and given course credit.

CHAPTER III

RESULTS

Descriptive Statistics

Means and standard deviations are presented in Table 1. BAS and BIS sensitivity were normally distributed in this sample. Across all participants, avoidance-focused coping was the most commonly chosen coping style (M = 203.87), followed by emotion-focused coping (M = 158.83), and then problem-focused coping (M = 132.29). Zero-order Pearson correlations among the seven study variables are presented in a correlation matrix in Table 2. These results address hypotheses 1-4.

We hypothesized that BIS sensitivity would be positively associated with stress and negatively associated with changeability (hypothesis 1). Consistent with predictions, BIS sensitivity was positively correlated with cognitive appraisals of stress ($p < .01$). Contrary to predictions, BIS sensitivity was positively correlated with cognitive appraisals of changeability ($p < .05$). We hypothesized that BAS sensitivity would be negatively associated with stress and positively associated with changeability (hypothesis 2). Consistent with predictions, BAS sensitivity was positively correlated with cognitive appraisals of changeability ($p < .01$). Contrary to predictions, BAS sensitivity was positively correlated with cognitive appraisals of stress ($p < .05$). It is important to note that although there is a positive correlation between BIS sensitivity, BAS sensitivity, and perception of stress, the magnitude of the correlation is much greater for BIS sensitivity

(r = .542, $p < .01$), as expected, when compared to BAS sensitivity (r = .110, $p < .05$). Using Fisher's z test to compare the magnitude of these two correlations, an r-to-z transformation revealed a significant difference between the correlation of BIS sensitivity and perception of stress and BAS sensitivity and perception of stress (z = 10.35, $p < .001$).

We hypothesized that BIS sensitivity would be positively associated with emotion- and avoidance-focused coping, but not associated with problem-focused coping (hypothesis 3). As predicted, BIS sensitivity was positively correlated with avoidance-focused coping ($p < .01$). Surprisingly, BIS sensitivity was unrelated to emotion-focused coping and negatively correlated with problem-focused coping ($p < .01$). We hypothesized that BAS sensitivity would not be differentially associated with emotion-, avoidance-, and problem-focused coping (hypothesis 4). Contrary to predictions, BAS sensitivity was positively correlated with avoidance-focused coping ($p < .05$), negatively correlated with problem-focused coping ($p < .01$), and unrelated to emotion-focused coping.

BIS and BAS sensitivity were positively correlated with each other ($p < .01$). The cognitive appraisal of stress was positively correlated with emotion-focused coping ($p < .01$) and negatively correlated with problem-focused coping ($p < .05$). Similarly, the cognitive appraisal of changeability was positively correlated with emotion-focused coping ($p < .01$) and negatively correlated with problem-focused coping ($p < .01$). The cognitive appraisals of stress and changeability were unrelated to avoidance-focused

coping. Cognitive appraisals of stress and changeability were positively correlated with each other ($p < .01$).

Bootstrapping Mediation Analyses

Although classical models of mediation, such as Baron and Kenny (1986), are often used to test the conditions required for mediation, this study applied a newer model of mediation by Hayes (2009) and looked at indirect effects using a bootstrapping method. Bootstrapping provides a more powerful statistical approach and was used to test whether the indirect effect of BIS on coping through cognitive appraisals was significantly different from zero. The indirect effect is considered the product term of the a path x b path. Partial mediation maintains that the mediating variable accounts for some, but not all, of the relationship between the independent and dependent variable. Partial mediation implies that there is not only a significant relationship between the mediator and the dependent variable, but also some direct relationship between the independent and dependent variable, even after controlling for the effect of the mediator.

Bootstrapping (Bollen & Stine, 1990) was used to examine whether cognitive appraisals of stress and changeability mediate relations between BIS and coping. The Preacher and Hayes (2008) SPSS macro was used to test mediation and by repetitively sampling from the available data, this method provided an unbiased confidence interval for the mediated effect. The indirect effect is significant if zero is not included in the 95% bias corrected confidence intervals for the indirect effect (Hayes, 2012).

BIS & Emotion-focused Coping

For bootstrapping analyses, each mediator (cognitive appraisal of stress, cognitive appraisal of changeability) was put into the model separately. We predicted that cognitive appraisals that situations are stressful and/or unchangeable would partially mediate the relationship between BIS and emotion-focused coping strategies (hypothesis 5). Based on 5,000 bias-corrected bootstrapped samples, the indirect effect indicated that the cognitive appraisal of stress (β = .82, 95% CI [.48, 1.20]) acted as a suppressor variable in the relationship between BIS and emotion-focused coping. Contrary to predictions, BIS was not significantly associated with emotion-focused coping (β = -.53, t (427) = -1.86, p = .06). Consistent with predictions, BIS was positively associated with perception of stress (β = 1.25, t (427) = 13.34, p < .001) and perception of stress was positively associated with emotion-focused coping (β = .66, t (427) = 4.60, p < .001). When controlling for the mediator, the direct effect of BIS on emotion-focused coping became significant (β = -1.35, t (427) = -4.09, p < .001). Suppression was indicated since the direct effect of the independent variable on the dependent variable was greater than the total effect of the independent variable on the dependent variable. According to MacKinnon et al. (2000), suppression is indicated in "a situation in which the magnitude of the relationship between an independent variable and a dependent variable becomes larger when a third variable is included" (p. 3).

Similarly, the cognitive appraisal of changeability (β = .10, 95% CI [.02, .23]) acted as a suppressor variable in the relationship between BIS and emotion-focused coping. Again, contrary to predictions, BIS was not significantly associated with

emotion-focused coping (β = -.53, t (427) = -1.86, p = .06). Inconsistent with predictions, BIS was positively associated with perception of changeability (β =.24, t (427) = 2.20, p < .05) and perception of changeability was positively associated with emotion-focused coping (β = .40, t (427) = 3.21, p < .01). When controlling for the mediator, the direct effect of BIS on emotion-focused coping was significant (β = -.62, t (427) = -2.21, p < .05). Suppression was indicated since the direct effect of the independent variable on the dependent variable was greater than the total effect of the independent variable on the dependent variable.

BIS & Avoidance-focused Coping

We predicted that cognitive appraisals that situations are stressful and/or unchangeable would partially mediate the relationship between BIS and avoidance-focused coping strategies (hypothesis 6). The significant indirect effect indicated that the cognitive appraisal of stress (β = -.92, 95% CI [-1.48, -.42]) acted as a suppressor variable in the relationship between BIS and avoidance-focused coping. Consistent with predictions, BIS was positively associated with avoidance-focused coping (β = 2.16, t (427) = 5.02, p < .001) and perception of stress (β = 1.25, t (427) = 13.34, p < .001). Contrary to predictions, perception of stress was negatively associated with avoidance-focused coping (β = -.74, t (427) = -3.35, p < .001). When controlling for the mediator, the direct effect of BIS on avoidance-focused coping was significant (β = 3.08, t (427) = 6.09, p < .001). Suppression was indicated since the direct effect of the independent variable on the dependent variable was greater than the total effect of the independent variable on the dependent variable.

Surprisingly, the cognitive appraisal of changeability (β = .05, 95% CI [-.02, .21]) did not mediate the relationship between BIS and avoidance-focused coping. Again, consistent with predictions, BIS was positively associated with avoidance-focused coping (β = 2.16, t (427) = 5.02, $p < .001$). Contrary to predictions, BIS was positively associated with perception of changeability (β =.24, t (427) = 2.20, $p < .05$). Surprisingly, perception of changeability was not significantly associated with avoidance-focused coping (β = .20, t (427) = 1.07, $p = .29$). When controlling for the mediator, the direct effect of BIS on avoidance-focused coping remained significant (β = 2.11, t (427) = 4.88, $p < .001$).

BIS & Problem-focused Coping

Although no direct hypotheses were made about a mediational model including BIS, cognitive appraisal, and problem-focused coping, the following results were found. In the test of whether cognitive appraisals of stress mediate the association between BIS and problem-focused coping, the indirect effect was not significant (β = .10, 95% CI [-.33, .56]), indicating that mediation did not occur. BIS was negatively associated with problem-focused coping (β = -1.64, t (427) = -4.64, $p < .001$). Consistent with predictions, BIS was positively associated with perception of stress (β = 1.25, t (427) = 13.34, $p < .001$). Perception of stress was not significantly associated with problem-focused coping (β = .08, t (427) = .44, $p = .66$). When controlling for the mediator, the direct effect of BIS on problem-focused coping was significant (β = -1.74, t (427) = -4.14, $p < .001$).

Unexpectedly, the cognitive appraisal of changeability (β = -.14, 95% CI [-.33, -.03]) partially mediated the relationship between BIS and problem-focused coping. Again, BIS was negatively associated with problem-focused coping (β = -1.64, t (427) = -4.64, $p < .001$). Inconsistent with predictions, BIS was positively associated with perception of changeability (β =.24, t (427) = 2.20, $p < .05$). Perception of changeability was negatively associated with problem-focused coping (β = -.60, t (427) = -3.92, $p < .001$). When controlling for the mediator, the direct effect of BIS on problem-focused coping was still significant (β = -1.49, t (427) = -4.28, $p < .001$), indicating partial mediation.

BAS Results

Although the current study did not include hypotheses for mediational models involving BAS sensitivity, the following results are included as exploratory analyses. Based on 5,000 bias-corrected bootstrapped samples, results indicated that cognitive appraisals of stress (β = .04, 95% CI [-.03, .09]) and changeability (β = .05, 95% CI [-.02, .11]) did not mediate the relationship between BAS and emotion-focused coping. Similarly, cognitive appraisals of stress (β = -.03, 95% CI [-.14, .03]) and changeability (β = .06, 95% CI [-.01, .17]) did not mediate the relationship between BAS and avoidance-focused coping. Finally, cognitive appraisals of stress (β = -.02, 95% CI [-.03, .19]) and changeability (β = -.11, 95% CI [-.17, .01]) did not mediate the relationship between BAS and problem-focused coping.

CHAPTER IV

DISCUSSION

Recent research by Carver and Connor-Smith (2010) suggesting the importance of personality variables in understanding coping has laid the groundwork in our field for understanding how personality variables influence the stress and coping process. The current study added to the stress and coping literature by demonstrating how reinforcement sensitivity, a biologically-based theory of personality, may explain individual differences in cognitive appraisals and coping strategies. This study used a unique methodology to examine whether cognitive appraisals mediate relationships between reinforcement sensitivity and coping.

It was hypothesized that BIS sensitivity would be positively associated with stress and negatively associated with changeability (hypothesis 1). Given the nature of BIS as an anxiety system and consistent with hypotheses, correlation analyses showed a positive relationship between BIS sensitivity and perception of stress when individuals were presented with a stress vignette. However, contrary to what was predicted, there was also a positive relationship between BIS sensitivity and perception of changeability. While it was hypothesized that these individuals would have a greater perception that these stressful situations were unchangeable, it may be that the vignettes they were shown, which represent ambiguous everyday situations, were considered stressful by an

undergraduate population but typical enough that they felt like the situations could still be changed or modified.

It was also hypothesized that BAS sensitivity would be negatively associated with stress and positively associated with changeability (hypothesis 2). Consistent with hypotheses, correlation analyses showed a positive relationship between BAS sensitivity and perception of changeability. This finding is consistent with the goal-directed nature of individuals higher in BAS sensitivity. However, contrary to what was predicted, there was also a positive relationship between BAS sensitivity and perception of stress. This may suggest that all participants found the vignettes stressful and perceived the stressors presented to them to be relevant and relatable to their own lives, thereby inducing stress despite their reinforcement sensitivity. It is important to note that results from Fisher's z test indicated that the correlation between BAS sensitivity and perception of stress was significantly less than the correlation between BIS sensitivity and perception of stress ($p < .001$).

We hypothesized that BIS sensitivity would be positively associated with emotion- and avoidance-focused coping, but not associated with problem-focused coping (hypothesis 3). As predicted, BIS sensitivity was positively correlated with avoidance-focused coping, indicating that individuals higher in BIS were more likely to choose avoidance-focused coping strategies. As previous studies have shown an association between BIS sensitivity and avoidant behaviors (Carver & White, 1994; Gable, Reis, & Elliot, 2000; Kambouropoulos & Staiger, 2004; Meyer et al., 2005; Hasking, 2006, 2007), the findings of this study similarly suggest a relationship between BIS sensitivity

and avoidance-focused coping strategies utilized to relieve distress or negative emotionality associated with stressors. Inconsistent with predictions that individuals higher in BIS would also be more likely to choose emotion-focused coping strategies, BIS sensitivity was not significantly correlated with emotion-focused coping. While the coping strategies that were provided to the participants were chosen carefully using confirmatory factor analyses, it may be that the sample emotion-focused coping behaviors were not as relevant or mapping close enough to what the individuals would actually do in the situation. In contrast, avoidance-focused coping responses, such as turning to drugs or alcohol, may have been more relevant to an undergraduate population given the culture of a college campus. Although we predicted that BIS sensitivity would be positively associated with emotion-focused coping, there is some evidence that suggests they may be unrelated. For instance, Connor-Smith and Flachsbart (2007) found that behavioral inhibition was not related to emotion-focused coping and social support among participants. Contrary to our prediction that there would be no association, this study found BIS sensitivity to be negatively correlated with problem-focused coping, indicating that individuals higher in BIS were less likely to choose problem-focused coping strategies.

We also hypothesized that BAS sensitivity would not be differentially associated with emotion-, avoidance-, and problem-focused coping (hypothesis 4). Contrary to predictions, individuals higher in BAS sensitivity did show a difference in choosing between the three types of coping strategies. This study did not predict a direction for the relationship between BAS sensitivity and coping strategies because of the heterogeneous

nature of individuals with a high BAS sensitivity (Corr, 2008). While BAS sensitivity was not significantly correlated with emotion-focused coping, it was positively correlated with avoidance-focused coping, indicating that individuals higher in BAS were more likely to choose avoidance-focused coping strategies. This association may have been due to the type of avoidance strategies that were assessed. For example, when presented with avoidance strategies related to alcohol or drug use, high BAS participants might be engaging in these behaviors because they are rewarding and not because they are trying to avoid something else. It may be that BAS sensitivity leads to avoidance when certain situations are not appraised as having the potential for reward. In addition, BAS sensitivity was negatively correlated with problem-focused coping, indicating that individuals higher in BAS were less likely to choose problem-focused coping strategies. Given the multi-faceted nature of BAS and heterogeneity of BAS-related goals (Corr, 2008), the mechanism by which BAS sensitivity predicts coping behaviors or a pattern in coping with stress is still unclear from the current study.

The current study hypothesized that individual differences among participants in reinforcement sensitivity would predict the selection of coping behavior. Surprisingly, across all participants, avoidance-focused coping was the most commonly chosen coping style, followed by emotion-focused coping, and then problem-focused coping. Without the mediators included, this indicates that the pattern of choosing coping strategies is the same for BIS and BAS, such that there is a positive association with avoidance-focused coping, negative association with problem-focused coping, and no association with emotion-focused coping. Given that the associations between personality variables and

coping strategies were in the same direction regardless of BIS or BAS sensitivity, this may suggest that BIS and BAS are not the best predictors of coping style.

BIS & Emotion-focused Coping

It was predicted that cognitive appraisals that situations are stressful and/or unchangeable would partially mediate the relationship between BIS and emotion-focused coping strategies (hypothesis 5). Results for emotion-focused coping indicated that the cognitive appraisals of stress and changeability acted as suppressor variables in the relationship between BIS and emotion-focused coping. Suppression effects suggest that the association is actually getting stronger after entering the mediators into the model. Thus, the association between BIS and emotion-focused coping is actually getting stronger after including the cognitive appraisals of stress and changeability into the model. Therefore, there was no support for the hypothesis that cognitive appraisals of stress and changeability would mediate the association between BIS and emotion-focused coping. As expected, individuals higher in BIS sensitivity experienced increased perceptions of stress. Contrary to the hypotheses, those higher in BIS did not experience increased perceptions that the stressors were unchangeable. The direct effect of the independent variable on the dependent variable revealed a significant relationship, suggesting that individuals higher in BIS sensitivity were less likely to choose emotion-focused coping strategies. This finding is inconsistent with previous work which suggests that individuals higher in BIS sensitivity will use emotion-focused coping strategies to lessen the emotional distress they feel as it relates to their increased level of stress.

BIS & Avoidance-focused Coping

It was predicted that cognitive appraisals that situations are stressful and/or unchangeable would partially mediate the relationship between BIS and avoidance-focused coping strategies (hypothesis 6). Results for avoidance-focused coping indicated that the cognitive appraisal of stress acted as a suppressor variable in the relationship between BIS and avoidance-focused coping. A suppression effect suggests that the association is actually getting stronger after entering the mediator into the model. Therefore, there was no support for the hypothesis that cognitive appraisals of stress would mediate the association between BIS and avoidance-focused coping. Unexpectedly, the cognitive appraisal of changeability also did not mediate the relationship between BIS and avoidance-focused coping. The mediation model showed that BIS sensitivity led to increased perceptions of stress and changeability, rather than the prediction that it would lead to decreased perceptions of changeability. This indicates that individuals higher in BIS experience increased perceptions of stress but do not experience increased perceptions that the stressful situations were unchangeable. The direction of this effect suggests that instead of what was expected, these individuals still experienced the cognitive appraisal that the stressors could possibly be modified. The direct effect of the independent variable on the dependent variable showed that individuals higher in BIS sensitivity were more likely to choose avoidance-focused coping strategies. This finding is consistent with previous research which has suggested that individuals higher in sensitivity to punishment may have greater difficulty regulating negative emotions, thereby encouraging them to use avoidance strategies (Tull, Gratz,

Latzman, Kimbrel, & Lejuez, 2010). Unexpectedly, the effect of the mediator on the dependent variable showed that increased perceptions of stress led to less avoidance-focused coping and increased perceptions of changeability led to more avoidance-focused coping.

BIS & Problem-focused Coping

There were no predictions made about the indirect effect of BIS sensitivity on problem-focused coping through cognitive appraisals. However, results indicated that the cognitive appraisal of changeability partially mediated the relationship between BIS sensitivity and the use of problem-focused coping. In contrast, the indirect effect was not significant in the test of whether cognitive appraisals of stress mediate the association between BIS and problem-focused coping, indicating that mediation did not occur. The direct effect of the independent variable on the dependent variable showed that individuals higher in BIS sensitivity were less likely to choose problem-focused coping strategies. This finding is consistent with previous research which has suggested that individuals higher in BIS sensitivity may be encouraged to use avoidance strategies given their increased difficulty regulating negative emotions, as opposed to problem-focused coping behaviors that require them to focus attention on the problem (Tull, Gratz, Latzman, Kimbrel, & Lejuez, 2010). The direct effect of the mediator on the dependent variable showed that increased perceptions of stress led to more problem-focused coping and increased perceptions of changeability led to less problem-focused coping.

BAS Results

The current study included mediational models involving BAS sensitivity as exploratory analyses. Since the bootstrapping analyses did not support the mediation of cognitive appraisals with BAS sensitivity, it may be that these individuals are focusing less attention on perceived stress or changeability of an event and focusing more attention on achieving their goals given their approach tendencies. This is not surprising given previous findings that the approach tendencies underlying BAS sensitivity predict task-oriented, planful, and goal-directed behaviors under stress (Bolger, 1990; McNaughton & Corr, 2004, 2008a).

Limitations

One limitation of the current study is the ranking scheme that participants were asked to use in ordering coping strategies. The ranking method that was asked of participants to order coping strategies actually forced negative correlations between the coping strategies and resulted in clustering of the coping styles. An alternative method would have been to allow participants to rate each of the nine coping styles separately by asking "How likely are you to use this method?" on a Likert-type scale. This approach would have prevented this clustering effect of coping styles and allowed for them to be statistically independent. For instance, the original method limits the ability to draw any conclusions about problem-focused coping versus emotion-focused coping such that any effects on one of the coping styles could be due to the effects of the other coping strategies. In addition, it should be noted that due to the large sample size of the current study (n = 429), the absolute values of the zero-order Pearson correlations were low.

Clinical Implications

An understanding of the coping differences among individuals in response to stressful life events can be especially helpful when considering a clinical setting. This study attempted to better our understanding of the role of personality and cognition in the study of stress and coping strategies, specifically whether individual differences in personality uniquely predict coping behaviors and associated cognitive appraisals. Cognitive behaviors are important to examine when considering that maladaptive coping is central to the development of certain disorders and psychopathology among individuals. This research may prove helpful for mental health professionals to recognize certain characteristics of individuals in an effort to improve treatment outcomes or satisfaction in daily life. Recognizing individual differences in response to stress promotes the adoption of individualized treatment and the development of focused skills training for individuals depending on their personality styles, cognitive appraisals of stressful situations, or how the two interact. While stress and coping theory posits that coping behaviors should not be considered adaptive or maladaptive, it is reasonable to say that some coping strategies may produce better outcomes in certain situations. For instance, while avoidance-focused coping may provide an individual with short-term relief from distress, it may also diminish their motivation to return to stressors that may need to be addressed, thereby contributing to further avoidance. Also, while many stressful scenarios can be improved through the use of problem-solving, for example, some situations, such as dealing with grief over the loss of a loved one, are not a solvable problem. Previous research has suggested that an inflexible appraisal approach and a

limited coping repertoire are considered maladaptive (Bonanno & Burton, 2013; Folkman & Moskowitz, 2004). Encouraging individuals to be flexible and try new forms of coping has the potential to contribute to better outcomes. Previous work has suggested that individuals may benefit from interventions aimed at teaching flexibility of coping styles used depending on the stressor and targeting accurate appraisal strategies (Folkman et al., 1986). Mental health professionals can work with an individual's inflexible approach to coping by guiding them to reevaluate their cognitive appraisals of stressful events and encouraging them to adopt a range of coping styles. Certain cognitive-behavioral techniques, such as cognitive restructuring, may help individuals establish realistic cognitive appraisals of a stressful event, thereby promoting healthy coping behavior.

Future Directions

Extending the research on personality traits and coping behaviors could benefit from the use of experience sampling methodology, which would allow for an examination of the effects of BIS and BAS under naturally-occurring environmental conditions. ESM would allow us to get information about participants' cognitive appraisals and coping responses as they are occurring in real-life situations across a range of stressors. The ability to assess daily affect and daily cognition, two variables which change from day-to-day among individuals, appears to be a promising method for furthering our understanding of the impact of BIS and BAS on daily life. Additionally, the current study allowed participants to generate their own coping strategy in each situation presented by the vignettes before being prompted to rank order the list of nine

solutions from the COPE Inventory. Coding the open-ended responses would allow us to see how the participants' natural answers map onto the three types of strategies. Such analysis could help confirm that our response options were accurately chosen or that our chosen responses were missing some key element that participants were attempting to capture. The model proposed in this study could be modified to assess other personality variables, such as the Big Five dimensions instead of reinforcement sensitivity, or other cognitive variables, such as other aspects of thought patterns or specific cognitive content. While this study utilized an overall coping strategy score for individuals, future research should examine if the type of stressor that participants reviewed (e.g., interpersonal) predicts coping pattern differences across personality traits. The influence of other sociocultural variables, such as ethnic identity or socioeconomic status, would also be important to consider. In addition, other contextual factors related to an individuals' choice of coping behavior could be assessed, such as the level of importance placed on the stressful event, the amount of effort put towards the event, or whether the scenario is associated with an individual's actual recent life events. Since an individual's cognitive appraisals and coping styles can be limited by their BIS and/or BAS sensitivity, it will be important to consider the various short-term and long-term outcomes of the coping process, as well as what implications this has on psychological outcomes.

Finally, the results of this study indicated that BIS sensitivity was positively correlated with perceptions of changeability, suggesting that individuals higher in BIS would be more likely to perceive stressful situations as changeable. It may be that individuals higher in BIS sensitivity are more likely to utilize an internal locus of control,

thereby perceiving stressful situations as more in their control or amenable to change. While this finding was outside of the current study's predictions, it also sheds light on a potentially important area for future research that is underexplored in the existing literature. Future work should explore in greater detail the relationship between BIS sensitivity and the cognitive appraisal of changeability as this relationship is conceptually important when discussing individual differences research in stress and coping.

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APPENDIX A

BEHAVIORAL INHIBITION SYSTEM/BEHAVIORAL ACTIVATION SYSTEM SCALES (BIS/BAS SCALES)

A number of statements that people use to describe themselves are given below. Read each statement carefully and then select the appropriate number that indicates how you GENERALLY feel. There are no right or wrong answers. Do not spend too much time on any one statement but give the answer which seems to describe how you GENERALLY feel.

1 = Strongly Disagree
2 = Somewhat Disagree
3 = Somewhat Agree
4 = Strongly Agree

1. If I think something unpleasant is going to happen I usually get pretty "worked up."	1 2 3 4
2. When I get something I want, I feel excited and energized.	1 2 3 4
3. I will often do things for no other reason than that they might be fun.	1 2 3 4
4. When I want something, I usually go all-out to get it.	1 2 3 4
5. I worry about making mistakes.	1 2 3 4

APPENDIX B

INFREQUENCY SCALE FOR PERSONALITY MEASURES (IFS)

	Yes	No
1. On some mornings, do you get out of bed when you wake up?		
2. Have there been a number of occasions when people you know have said hello to you?		
3. Have there been times when you have dialed a telephone number only to find that the line was busy?		
4. At times when you were ill or tired, have you felt like going to bed early?		
5. On some occasions, have you noticed that some other people are better dressed than you?		

APPENDIX C

INTERPRETATION BIAS QUESTIONNAIRE (IBQ)

1. You check your voicemail, and you have two messages from earlier that day. Both are from your parents. Your parents don't say much in the messages, just to call them back as soon as you get the message. Why are they trying to reach you?

2. It's your second week on the job. Your boss stops by your desk in the early afternoon and asks you to come to his office later that day. Why does your boss want to see you?

3. You're walking down the street, and you see one of your friends coming the other way with a group of people. You wave, but your friend doesn't respond. Why?

4. You go on a blind date that was arranged by one of your friends. You go out to dinner and a movie. After the movie, your date suggests going out for dessert, so you stay out a little longer. At the end of the evening, your date asks for your phone number and promises to call. Two days later, you haven't received a call. Why?

5. You are applying for a summer internship, and the application requires a letter of recommendation. You email one of your professors to see if they would be willing to write one for you. When you don't hear back after one week, you email the professor again. Why hasn't the professor responded to your request?

APPENDIX D

COPE

We are interested in how people respond when they confront difficult or stressful events. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you did **during the last month** when you experienced stressful events. Obviously, different events bring out somewhat different responses, but think about what you did when you are under a lot of stress during the last month.

Fill in the correct circle using the response choices listed below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU—not what you think "most people" would say or do. **Indicate what YOU did in the last month when YOU experienced stressful events.**

1 = I didn't do this at all
2 = I did this a little bit
3 = I did this a medium amount
4 = I did this a lot

1. I try to grow as a person as a result of the experience.	1 2 3 4
2. I turn to work or other substitute activities to take my mind off things.	1 2 3 4
3. I get upset and let my emotions out. (*E)	1 2 3 4
4. I try to get advice from someone about what to do.	1 2 3 4
5. I concentrate my efforts on doing something about it.	1 2 3 4

*P = item given as a problem-focused coping solution
*A = item given as an avoidance-focused coping solution
*E = item given as an emotion-focused coping solution

APPENDIX E

TABLES AND FIGURES

Table 1

Descriptive Statistics for Study Variables (n = 429)

Variable	M	SD	Range
BAS Sensitivity	39.90	5.81	13 – 52
BIS Sensitivity	20.60	3.68	10 – 28
Perception of Stress	29.83	8.44	11 – 55
Perception of Changeability	26.56	8.31	11 – 54
Problem-focused Coping	132.29	27.44	80 – 219
Avoidance-focused Coping	203.87	33.65	77 – 264
Emotion-focused Coping	158.83	21.57	108 – 220

Note: BAS = Behavioral Approach System; BIS = Behavioral Inhibition System

Table 2

Correlations among the Study Variables

Variable	1	2	3	4	5	6	7
1. BAS Sensitivity	--	.178**	.110*	.126**	-.162**	.108*	.037
2. BIS Sensitivity		--	.542**	.106*	-.219**	.236**	-.090
3. Perception of Stress			--	.361**	-.101*	-.003	.133**
4. Perception of Changeability				--	-.204**	.075	.143**
5. Problem-focused Coping					--	-.769**	-.073
6. Avoidance-focused Coping						--	-.582**
7. Emotion-focused Coping							--

Note: ** p < .01; * p < .05; BAS = Behavioral Approach System; BIS = Behavioral Inhibition System

Figure 1. Indirect Effect of the Behavioral Inhibition System on Problem-focused Coping through Cognitive Appraisal of Stress.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

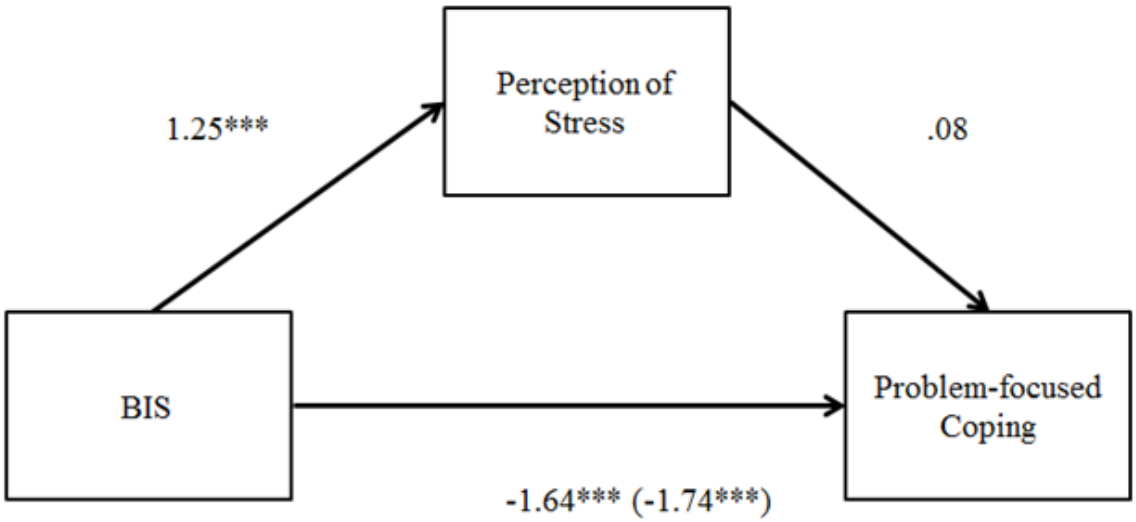

Figure 1. Indirect Effect of the Behavioral Inhibition System on Problem-focused Coping through Cognitive Appraisal of Stress.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

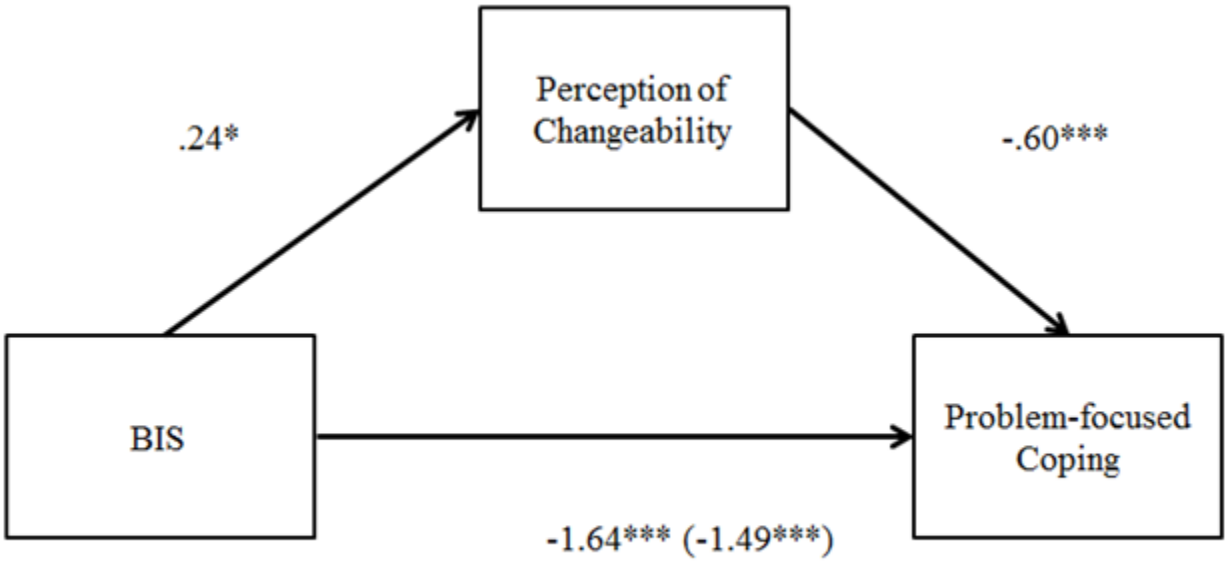

Figure 2. Indirect Effect of the Behavioral Inhibition System on Problem-focused Coping through Cognitive Appraisal of Changeability.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

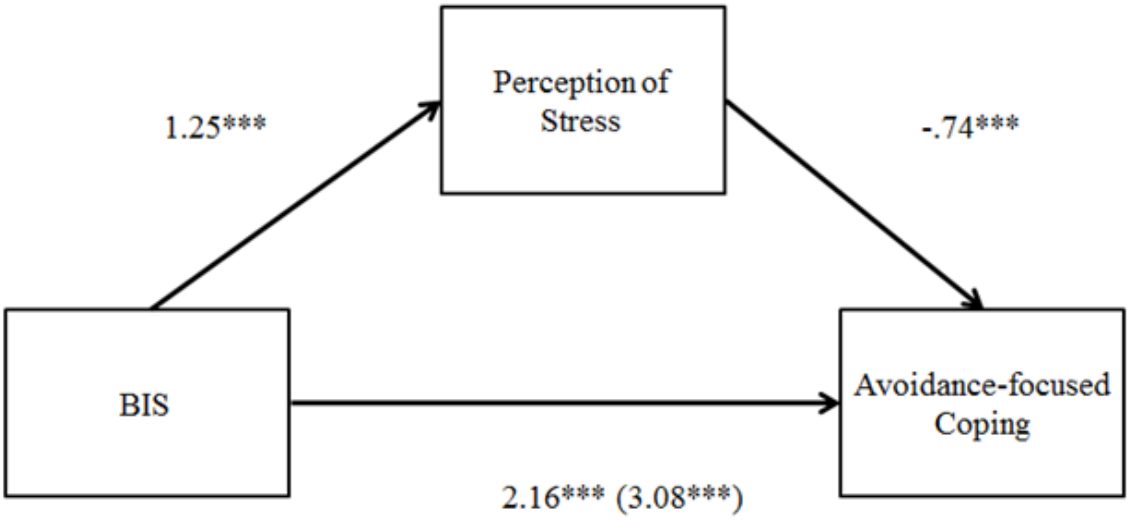

Figure 3. Indirect Effect of the Behavioral Inhibition System on Avoidance-focused Coping through Cognitive Appraisal of Stress.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

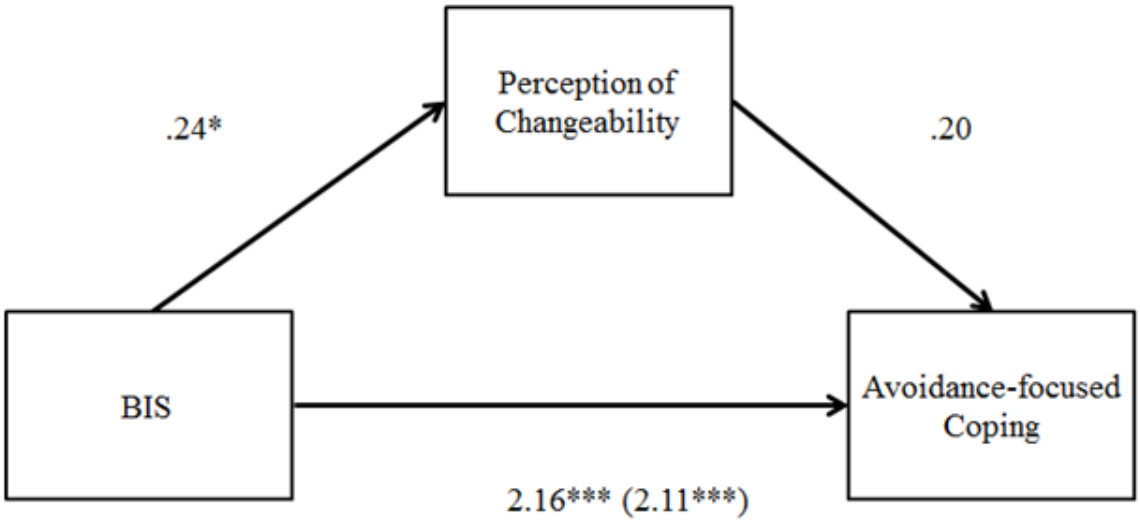

Figure 4. Indirect Effect of the Behavioral Inhibition System on Avoidance-focused Coping through Cognitive Appraisal of Changeability.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

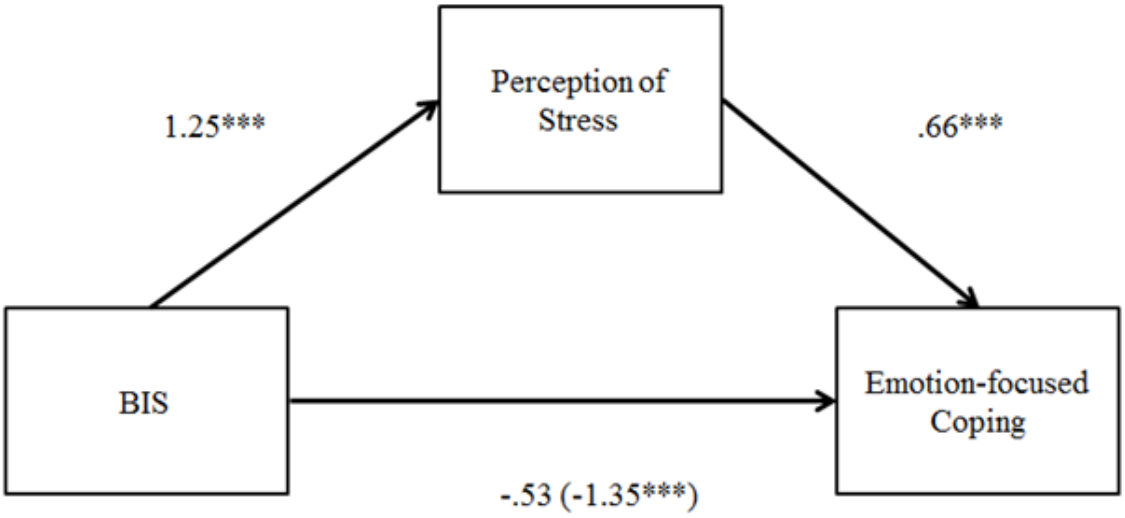

Figure 5. Indirect Effect of the Behavioral Inhibition System on Emotion-focused Coping through Cognitive Appraisal of Stress.

Note: *$p < .05$, **$p < .01$, ***$p < .001$

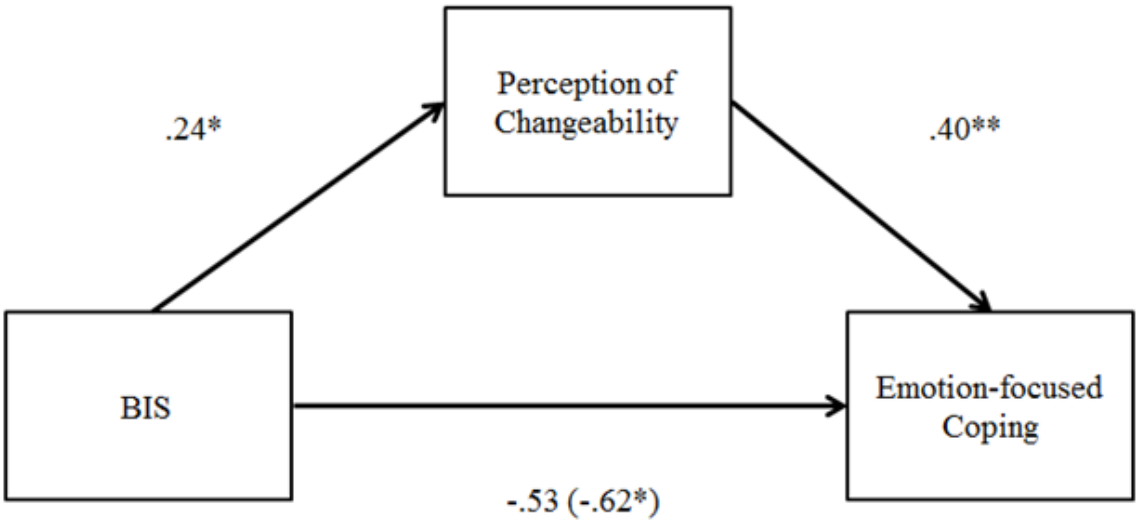

Figure 6. Indirect Effect of the Behavioral Inhibition System on Emotion-focused Coping through Cognitive Appraisal of Changeability.

Note: *$p < .05$, **$p < .01$, ***$p < .001$